

REMARKS

Claims 1-23 are pending. Claims 18-22 have been withdrawn from consideration as being directed to non-elected inventions. Reconsideration in view of the following remarks is respectfully requested.

Claim Rejection – 35 USC § 102

Claims 1-3, 5-10, 14, and 17 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Tanabe (US Patent No. 5,476,736). Applicants respectfully traverse this rejection for at least the following reason.

The Examiner contends that Tanabe discloses a method of projecting an image onto the surface of a photoresist coated wafer using a projection optical system, comprising performing a first exposure using a first mask to form a first optical image on the photoresist film, performing a second exposure using a second mask to form a second optical image on the photoresist film, wherein the first and second exposures are illuminated by an illumination beam that has a dipolar intensity distribution (references 1, 2 and 3 of Figures 4A-4B). The Examiner further contends that Tanabe, in col. 8, lines 29-39, and lines 36-67, and in FIGs. 11A and 11B, discloses that the first and second exposures are in dipolar illumination mode. Applicants respectfully disagree.

In Tanabe, the projection beam is darkened at its central part with modification member 1 (shown in FIGs. 4A and 4B and in FIGs. 11A and 11B) by either using interruption plate 25 which has a ring-shaped transparent part 25a disposed concentrically with plate 25 (see FIG. 5A and col. 5, lines 33-34 in Tanabe) or by using interruption plate 26 which has four transparent parts 26a each of which is the same quarter circle in shape (see FIG. 5B and col. 5, lines 40-47). The Examiner seems to be interpreting the two openings in modification member 1, shown in FIGs. 3, 4A and 4B, as forming a dipole illumination. However, FIGs. 3, 4A and 4B merely show a cross section of the annular-shaped or quadrupole aperture-shaped modification member 1. Therefore, Tanabe does not disclose, teach or suggest anywhere using a dipole illumination.

In contrast, claim 1 recites, *inter-alia*, performing an exposure having a substantially dipolar intensity distribution. Contrary to the Examiner's contention, Tanabe is completely silent about using a dipolar illumination as recited in claim 1. Moreover, Tanabe is also silent about performing at least one of the first and second exposures using an illumination mode having a substantially dipolar intensity distribution.

By using a substantially dipolar illumination during the first and/or the second exposures, as recited in claim 1, it is possible, for example, to form reduced feature size and/or improved processing parameters such as, but not limited to, exposure latitude, mask error, depth of focus and proximity effects, without having to use improved optics and/or diffraction-assisted masks (see, for example, page 3, lines 5-8 of the specification).

Consequently, Tanabe does not disclose, teach or suggest the subject matter recited in claim 1.

Therefore, for at least the above reasons, Applicants respectfully submit that claim 1 and claims 2, 3, 5-10, 14 and 17 which are directly or indirectly dependent from claim 1, are patentable and respectfully request that the rejection of claims 1-3, 5-10, 14 and 17 under § 102(b) be withdrawn.

Claim Rejection – 35 USC § 103

Claims 4 and 23 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tanabe (US Patent No. 5,476,736) in view of Neisser (US patent No. 5,563,012). Applicants respectfully traverse this rejection for at least the following reason.

Claims 4 and 23 are indirectly dependent from claim 1. Therefore, for at least the reasons presented above in claim 1, Tanabe does not disclose, teach or suggest the subject matter recited in claims 4 and 23. Neisser fails to overcome the deficiencies noted above in Tanabe. Specifically, Neisser fails to disclose, teach or suggest anything about a substantially dipolar illumination. Consequently, neither Tanabe nor Neisser, alone or in combination, disclose, teach or suggest the subject matter recited in claims 4 and 23.

Therefore, Applicants respectfully submit that claims 4 and 23 are patentable and respectfully request that the rejection of claims 4 and 23 under § 103(a) be withdrawn.

Claims 11-13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tanabe (US Patent No. 5,476,736) in view of Nishi (US Patent Application Publication No. 2002/0109827 A1). Applicants respectfully traverse this rejection for at least the following reason.

Claims 11-13 are directly or indirectly dependent from claim 1. Therefore, for at least the reasons presented above in claim 1, Tanabe does not disclose, teach or suggest the subject matter recited in claims 11-13. Moreover, Nishi fails to overcome the deficiencies noted

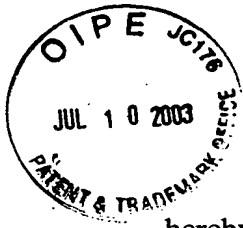
above in Tanabe. Specifically, contrary to the Examiner's contention, Nishi fails to disclose, teach or suggest anything about a substantially dipolar illumination or dipolar intensity distribution. In fact, Nishi teaches using annular illumination as shown in FIG. 7(a) or disk illumination 166A, annular illumination 166B and quadrupole illumination 166C as shown in FIG. 11(b). Consequently, neither Tanabe nor Nishi, alone or in combination, disclose, teach or suggest the subject matter recited in claims 11-13.

Therefore, Applicants respectfully submit that claims 11-13 are patentable and respectfully request that the rejection of claims 11-13 under § 103(a) be withdrawn.

Claims 15-16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tanabe (US Patent No. 5,476,736) in view of Maeda et al. (US Patent No. 6,263,099). Applicants respectfully traverse this rejection for at least the following reason.

Claims 15 and 16 are directly or indirectly dependent from claim 1. Therefore, for at least the reasons presented above in claim 1, Tanabe does not disclose, teach or suggest the subject matter recited in claims 15 and 16. Moreover, Maeda et al. fails to overcome the deficiencies noted above in Tanabe. Specifically, Maeda et al. does not disclose, teach or suggest performing at least one of a first and a second exposures using an illumination mode having a substantially dipolar intensity distribution. Maeda et al. merely teaches a method for inspecting a micro-fine defect of a pattern. The micro-fine pattern is inspected by irradiating an annular-looped illumination through an objective lens onto a wafer and image signals are obtained by detecting a reflected light from the wafer. The image signals are then compared with a reference image. The annular-looped illuminations of Maeda et al. simply consist of a ring-shaped mask element in which a portion is made transparent. The ring-shaped attenuation filter serves to control the intensity of the 0th order diffraction light entering into the pupil of the objective lens. Thus, Maeda et al. says nothing about the method recited in claims 15 and 16. Consequently, neither Tanabe nor Meada et al., alone or in combination, disclose, teach or suggest the subject matter recited in claims 15 and 16.

Therefore, Applicants respectfully submit that claims 15 and 16 are patentable and respectfully request that the rejection of claims 15 and 16 under § 103(a) be withdrawn.



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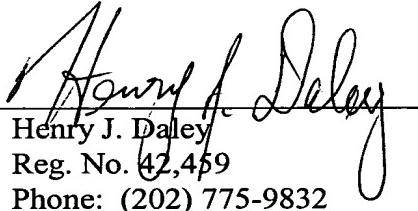
CONCLUSION

In view of the foregoing, the claims are now in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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